

**Remarks**

This application has been reviewed in light of the Office Action of April 26, 2005. Claims 12-25 are pending, and all claims are rejected. In response, the following remarks are submitted. Reconsideration of this application is requested.

Claims 12-17 and 19-24 are rejected under 35 USC 103 over Moore US Pub. 2003/0161946 in view of Knight et al. Article. Applicant traverses this ground of rejection.

The following principle of law applies to all sec. 103 rejections. MPEP 2143.03 provides "To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the applied prior art references clearly do not arguably teach some limitations of the claims.

Claim 12 recites in part:

"measuring a flow rate of the fuel to the deposition gun, a flow rate of the oxidizer to the deposition gun, a flow rate of the powder to the deposition gun, and a cooling capacity of the coolant flow;"

Claim 19 recites in part:

"measuring a flow rate of the fuel to the deposition gun, a flow rate of the oxidizer to the deposition gun, a flow rate of the powder to the deposition gun, and a cooling capacity of the flowing coolant;"

Moore has no teaching of this limitation, see first paragraph on page 4 of the Office Action. The explanation of the rejection asserts (page 4, first and second paragraphs) that Knight Article teaches this limitation. Applicant respectfully traverses this assertion. Knight teaches that certain parameters may be variables, but says nothing about them being "important" or that they should be measured (second full paragraph in right hand column on page 159). There is no teaching on page 159 or elsewhere that fuel flow rate and oxygen flow rate are even of interest (only the ratio is mentioned).

More to the point, in the paragraph immediately below Table I on page 160, Knight Article identifies the "three key spray parameters: surface speed of the part, spray distance, and fuel:oxygen ratio" that are varied. The Knight Article teaches that "all other parameters were fixed at the baseline values" (page 160, first paragraph after Table I). No mention is made of flow rates of fuel, oxidizer, and powder, and cooling capacity as being important parameters to be measured or controlled, and in fact the teaching is that all parameters are kept fixed at the baseline values, except for the three listed above. Nor is any mention made of "measuring" these quantities during operation of the HVOF apparatus. As the caption to Table I states, the manufacturer's "recommended" operating parameters, except for the "three key spray parameters", were used.

Each of claims 12 and 19 further recites in part:

"set-point controlling the flow rate of the fuel, the flow rate of the oxidizer, the flow rate of the powder, and the cooling capacity of the coolant flow, all responsive to the step of measuring".

Neither reference has any such teaching. Moore teaches using a feedback controller, and mentions parameters that may be used as the basis for the feedback control: variations in temperature, fluctuations in coating process parameters, and fluctuations in the coating process parameters. There is no mention of flow rates of fuel or oxidizer, flow rate of powder, or cooling capacity.

The fact of the matter is that neither reference points the way to the measurement and active control of the parameters recited in the present claims.

Para. [0029] of the present Specification presents a direct experimental comparison between the present approach and the closest prior art. The present approach produced surprising and unexpected improvements in the performance of the sprayed coatings.

Regarding claims 13-14 and 20-21, these claims recite "measuring" coolant temperature and coolant flow rate, respectively, and neither reference has any such teaching.

The limitations of claims 15 and 22 are not taught by either reference, and the explanation of the rejection does not even mention these claims. If the rejection is maintained, Applicant asks that the Examiner point out the location in the references where the limitations of these claims are said to be taught.

Each of claims 16 and 23 recites providing an instrumentation array for measuring specific quantities. Neither reference has a teaching of such an instrumentation array. Para. [0034] of Moore has no mention of measuring any of the quantities recited in claim 16.

Each of claims 17 and 24 recites automatic control of four parameters responsive to their measured values. Para. [0034] of Moore does not mention any of these parameters.

The present rejection is a sec. 103 combination rejection. It is well established that a proper sec. 103 combination rejection requires more than just finding teachings in the references of the elements recited in the claim (but which was not done here). To reach a proper teaching of an article or process through a combination of references, there must be stated an objective motivation to combine the teachings of the references, not a hindsight rationalization in light of the disclosure of the specification being examined. MPEP 2143 and 2143.01. See also, for example, In re Fine, 5 USPQ2d 1596, 1598 (at headnote 1) (Fed.Cir. 1988), In re Laskowski, 10 USPQ2d 1397, 1398 (Fed.Cir. 1989), W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 311-313 (Fed. Cir., 1983), and Ex parte Levengood, 28 USPQ2d 1300 (Board of Appeals and Interferences, 1993); Ex parte Chicago Rawhide Manufacturing Co., 223 USPQ 351 (Board of Appeals 1984). As stated in In re Fine at 5 USPQ2d 1598:

"The PTO has the burden under section 103 to establish a prima facie case of obviousness. [citation omitted] It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

And, at 5 USPQ2d 1600:

"One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

Following this authority, the MPEP states that the examiner must provide such an objective basis for combining the teachings of the applied prior art. In constructing such rejections, MPEP 2143.01 provides specific instructions as to what must be shown in order to extract specific teachings from the individual references:

“Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention when there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).”

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“The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).”

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“A statement that modifications of the prior art to meet the claimed invention would have been ‘well within the ordinary skill of the art at the time the claimed invention was made’ because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. Ex parte Levengood, 28 USPQ2d 1300 (Bd.Pat.App. & Inter. 1993).”

Here, there is set forth no objective basis for combining the teachings of the references in the manner used by this rejection, and selecting the helpful portions from each reference while ignoring the unhelpful portions. An objective basis is one set forth in the art or which can be established by a declaration, not one that can be developed in light of the present disclosure. If the rejection is maintained, Applicant asks that the Examiner set forth the objective basis found in the references themselves for combining the teachings of the references, and for adopting only the helpful teachings of each reference and disregarding the unhelpful teachings of the reference.

The paragraph bridging pages 4-5 of the Office Action presents a hindsight rationale for measuring and controlling various parameters, but in fact neither reference teaches

measurement of these parameters during operation and control of the deposition apparatus. As noted above, Moore lists some parameters of interest, but not those recited in the present claims. The explanation of the rejection 3-4 lines from the top of page 5 of the Office Action asserts that "Knight Article teaches that desirable feature to control...", but in fact Knight Article sets those values at the recommended values of the manufacturer of the apparatus, and does not control or vary them at all, while intentionally varying the different "three key spray parameters". If anything, Knight Article teaches directly away from the present approach, and is wholly inconsistent with the asserted teachings of Moore. The whole point of the present approach is that using the recited parameters provided by the manufacturer is not satisfactory, see the comparative results of para. [0029] of the present application.

But even if the teachings are improperly combined, Moore and Knight Article do not reach the recited claim limitations. Moore does not mention measuring and controlling on the parameters recited in the present claims, and instead directs attention to other parameters. The Knight Article teaches that the parameters recited in the present claims are kept fixed at baseline values, to the extent that these parameters are addressed.

Applicant addresses the Response to Arguments found at page 7 et seq. of the Office Action. Applicant has carefully reviewed the Examiner's positions, but does not find them persuasive.

If Applicant understands the Response at pages 7-8 correctly, the Examiner does not disagree that neither reference teaches the specific claim limitations discussed above. If the Examiner maintains that there is any teaching of the specific claim limitations, Applicant asks that the location of such teaching be set forth in the Advisory Action. Otherwise, Applicant will take it as admitted for the appeal that the references do not teach "measuring a flow rate of the fuel to the deposition gun, a flow rate of the oxidizer to the deposition gun, a flow rate of the powder to the deposition gun, and a cooling capacity of the coolant flow" and "set-point controlling the flow rate of the fuel, the flow rate of the oxidizer, the flow rate of the powder, and the cooling capacity of the coolant flow, all responsive to the step of measuring". The broad generalizations of para. [0032]-[0034] of Moore do not teach these specific limitations.

The reference in Moore to controlling "all the components" means what it says--the physical components are controlled. The references to "coating process parameters" are all measurable parameters of the coated article. There is no suggestion of measuring and controlling parameters related to the inputs to a deposition device, and certainly no mention at all of the specific inputs to the deposition gun recited in the present claims. That

individual fuel flow rate and oxygen flow rate may vary has no relation to the teaching of the measurement of the ratio of fuel flow rate to oxygen flow rate.

Knight does not aid the case of the rejection, because Knight Article identifies the “three key spray parameters: surface speed of the part, spray distance, and fuel:oxygen ratio” that are varied. These parameters are not even mentioned by Moore. Knight Article does not suggest varying the parameters that are mentioned by Moore. Knight Article goes on to teach that “all other parameters were fixed at the baseline values”. If the Examiner has any way to reconcile these contrary teachings of Moore and Knight, Applicant asks that it be set forth in the Advisory Action. Otherwise, for the purposes of appeal Applicant will take it as admitted that the two references teach contrarily to each other, with completely disjoint sets of parameters to be controlled.

Regarding claims 13-14, these claims recite “measuring” recited parameters. In para. [0033], Moore teaches “controlling” parameters, but makes no mention of “measuring” those parameters. A person can control the flow of a kitchen faucet without measuring the flow rate, in a manner analogous with what Moore is teaching.

Regarding claim 15, the Response suggests that various recited components are taught by Knight, but they are simply not disclosed, except for the combustion chamber.

Regarding claims 16-17, Applicant appreciates that the Examiner has asserted that the recited features are present in the teachings of the references, but that does not cause them to actually be present. Absent specifically pointing out where the recited features are said to be taught in the references, Applicant will take it as admitted that they are not taught by the references.

Regarding the combination of references, neither the prior Office Action nor the present Office Action provides a reconciliation of the directly contrary teachings of the two references that Moore is said to teach that everything is controlled, while Knight says that everything is kept constant except for variations in three specific parameters (none of which are parameters recited in the present claims). This does not provide a basis for combining the teachings of the references.

As to the suggestion that a proper experimental comparison is to “Moore in view of Knight Article” (page 8, line 14-page 9, line 1 of final Office Action), no such thing exists. This is a hypothetical construct as to what a person of ordinary skill might do, and has no relation to current reality. Further, the proposed combination of “Moore in view of Knight Article” is said to teach the present invention, so the suggested comparison is the present invention to itself. The hypothetical construct “Moore in view of Knight Article” does not in any event teach the recited parameters discussed earlier. Applicant has provided an

experimental comparison to the closest actual prior art currently in use by those who actually do work in this field.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 18 and 25 are rejected under 35 USC 103 over Moore in view of Knight Article, and further in view of Nakagawa US 5,958,522. Applicant traverses this ground of rejection.

Claim 18 depends from claim 12, and claim 25 depends from claim 19. The limitations of the parent claims are not taught by the combination of Moore and Knight Article for the reasons discussed above and which are incorporated here. Nakagawa adds nothing in this regard.

Moore has no teaching that its approach is operable with hydrogen/oxygen, and no teaching that its various control features are operable with hydrogen/oxygen fuel/oxidizer.

Nakagawa is nonanalogous art. The Moore and Knight references deal with HVOF process, and it is for these teachings that the references are relied upon, see page 3, line 6 and page 4, line 4 of the final Office Action. Nakagawa has no mention of HVOF. Nakagawa deals with thermal spray, not HVOF. So whatever Nakagawa teaches about hydrogen/oxygen ratio, there is no reason to believe that it has any relevance to parameters in an HVOF process such as that taught by Moore and Knight Article.

It also appears that Nakagawa does not contemplate the use of "a deposition gun that burns a mixture of a fuel and an oxidizer to form a deposition gas flow, mixes a powder into the deposition gas flow to form a deposition mixture flow, and projects the deposition mixture flow therefrom," as recited in claim 12 and thence in claim 18, and as recited in claim 19 and thence in claim 25. The device pictured in Figure 1 of Nakagawa is not of this type, so the relevance of Nakagawa's teachings in any event are unclear.

The Response, in the paragraph bridging pages 10-11 of the final Office Action, addresses the "shape" of the device in Nakagawa as compared with the "shape" of the device in Knight. The shape of the two deposition devices is not relevant. The issue is whether they function in a similar manner. They do not, see the discussion above. The Response refers to "art recognized equivalents", but there is no reason to believe that different types of deposition devices are "equivalents", or that different fuel/oxidizer types are "equivalents" in respect to a hydrogen/oxygen ratio, the latter particularly in view of Knight Article's statement at page 160 that different types of fuels are not equivalent.

**CONCLUSION**

In view of the above, Applicant respectfully requests reconsideration of the Application and withdrawal of the outstanding objections and rejections. As a result of the amendments and remarks presented herein, Applicant respectfully submits that claims are not anticipated by nor rendered obvious by the cited art either alone or in combination and thus, are in condition for allowance. As the claims are not anticipated by nor rendered obvious in view of the applied art, Applicant requests allowance of all of the remaining claims in a timely manner. If the Examiner believes that prosecution of this Application could be expedited by a telephone conference, the Examiner is encouraged to contact the Applicant.

This Response has been filed within three (3) months of the mailing date of the Final Office Action and it is believed that no fees are due with the filing of this paper. In the event that Applicants are mistaken in their calculations, the Commissioner is hereby authorized to deduct any fees determined by the Patent Office to be due from the undersigned's Deposit Account No. 50-1059.

Applicant respectfully requests entry of the above amendment and allowance of the claims.

The Commissioner is hereby authorized to charge any additional fees and credit any overpayments to Deposit Account No. 50-1059.

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Respectfully submitted,

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